

### **REMARKS**

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. With this amendment, claims 1 and 24 have been amended, no claims have been cancelled without prejudice or disclaimer, and claims 39-48 have been added. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. Thus, claims 1, 2, 5-10, 24, 25, and 28-48 are pending in the application. Support for new claims 39-48 can be found in at least: claim 39 and 44 – paragraphs [0015], [0021], [0043], claims 40 and 45 – paragraph [0077], claims 41 and 46 – paragraph [0025], claims 42 and 47 – paragraphs [0010], [0011], and claims 43 and 48 – paragraph [0012]. No new matter has been added. No new matter has been added.

In addition, the Applicants would like to thank Examiner Pohnert for his comments and suggestions in the telephone interview held August 18, 2008.

#### **Claim Rejections - 35 USC § 112**

Claims 35 and 36 were rejected under 35 USC § 112 as being indefinite. Specifically, claims 35 and 36 were rejected for phrases, “wherein a location of a peak in a response spectra” and “the number of the particular labeled oligonucleotide probe” for lack of antecedent basis. Applicants respectfully traverse this rejection.

Claims 35 and 36 have been amended to recite “wherein a location of a peak in a response spectra *of a sample comprising the labeled oligonucleotide probes*” and “the number of a particular labeled oligonucleotide probe.” Applicants submit that amended claims 35 and 36 are definite and do not lack antecedent basis. Applicants therefore request withdrawal of the rejection.

#### **Claim Rejections - 35 USC § 102**

Claims 1-2, 5, 7-9, 24-25, 28, 31, 32, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Cronin et al (US patent 6,045,996, issued April 4, 2000). Claims 1, 2, 5-10, 24, 25, 28-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Han et al (Nature

Biotechnology (2001) volume 19, pages 631 -635). Claims 1-3 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Lockhart et al (WO97127317, published July 31, 1997).

Neither Cronin et al., Han et al., nor Lockhart et al. anticipate claims 1, 2, 5-10, 24, 25, and 28-40 because Cronin et al., Han et al., and Lockhart et al. lack an element recited in independent claims 1 and 24. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegall Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Independent claims 1 and 24 have been amended to recite, *inter alia*, "at least one of the labeled probes is *configured to be* identified by an intensity of at least one of the unique signal molecules." This feature is neither taught nor suggested by Cronin et al., Han et al., nor Lockhart et al.

In the office action, the Examiner states "[t]he claims are drawn to a composition, and compositions are defined by structural limitations. The arguments to the functional limitations of the oligonucleotide probes, are moot as they are not directed to the structure of the compositions as claimed." (Office action, p.6, l.6-10, p.9, l.18-22, p.12, l.3-7). However, "all words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). *See also* MPEP 2143.03. Further, there is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971); *In re Barr*, 444 F.2d 588, 170 USPQ 33 (CCPA 1971) (holding that the limitation used to define a radical on a chemical compound as "incapable of forming a dye with said oxidizing developing agent" although functional, was perfectly acceptable because it set definite boundaries on the patent protection sought). That is, the phrase "*configured to be* identified by an intensity of at least one of the unique signal molecules" functionally defines a structural feature of the labeled nucleotides.

Cronin et al. in contrast, teaches a probe that is not labeled. The probes in Cronin are simply unlabeled oligonucleotides immobilized to the array surface. In hybridization assays, the labeling is on the target, not the probes. Further, the examiner argues that "the hybridizing is

labeling a probe.” Although Cronin calls the hybridized oligonucleotide complex as labeled probes (column 7, line 55). Cronin’s hybridized oligonucleotide complex are structurally and functionally different from labeled probes in the claimed embodiments. Cronin’s probes are designed to bind to targets for optimal sensitivity and specificity of the hybridization assay, which is achieved by matching the length of the probe to the length of the target. If there is a length mismatch between the target and the probe, the unbound region could bind to another oligonucleotide sequence with partially complementary sequence, which will reduce the sensitivity and specificity of the hybridization assay. Therefore, the intent of a person carrying out a hybridization assay is to match the length of the target and the probe. The functional result is the reduction of an additional binding after hybridization, and the structural result is a hybridized oligonucleotide complex with minimal (or ideally zero) remaining binding region. To the contrary, labeled probes in the claimed embodiments, if made by hybridization, are designed to have a binding region so that they can be used for binding to an unlabeled target so that the unlabeled target and its sequence can be identified. If the probe is “labeled” by Cronin’s hybridizing a labeled target, the hybridized probe can no longer bind to an unlabeled target, and thus becomes useless. Further, Cronin does not teach identifying the type of nucleotide at each position by an intensity of at least one of the unique signal molecules. Cronin teaches identifying the type of nucleotide at each position in the labeled probe by the position on the array where the signal molecule lights up, but not by an intensity of the signal molecules.

Han et al., does not teach identifying the type of nucleotide at each position by an intensity of at least one of the unique signal molecules. As illustrated in the instant specification, the number of a unique signal molecule represents the type of nucleotide at each position. In contrast, Han et al. simply teach that numerous combinations can be made by mixing different quantum dots at different ratios. A person following Han cannot identify the type of nucleotide at each position by only looking at one type of unique signal molecule because the encoding described in Han requires reading all different colors in the code. In comparison, in the claimed invention, a unique molecule encodes the type of nucleotide at each position, which is not taught by Han.

Lockhart teaches a method of identifying difference in nucleic acid abundances by providing an array containing a large number of arbitrarily selected different oligonucleotide probes where the sequence and location of each different probe is known. Differences in the hybridization patterns between samples indicates differences in expression of various genes between those samples. Lockhart does not teach “at least one of the labeled probes is *configured to be* identified by an intensity of at least one of the unique signal molecules” as recited in independent claims 1 and 24.

Simply, neither Cronin, Han, nor Lockhart teaches “at least one of the labeled probes is *configured to be* identified by an intensity of at least one of the unique signal molecules” as recited in independent claims 1 and 24. Therefore, none of these references anticipate independent claims 1 and 24 or any of the claims that depend on these claims. Applicants respectfully request withdrawal of these rejections.

## New Claims

Claims 39-48 include additional features not found in the applied references and therefore are allowable for at least this reason.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: September 24, 2008

Respectfully submitted,

By /Martin Sulsky/  
Martin Sulsky  
Registration No.: 45,403  
DARBY & DARBY P.C.  
1500 K Street, NW  
Suite 250  
Washington, DC 20005-1714  
(202) 347-7865  
(202) 347-7866 (Fax)  
Attorneys/Agents For Applicant